CLAIMS

What is claimed is:

1. A method for the classification of a population, comprising:

analyzing medical histories of a population;

analyzing medical test results for the population; and

based on the medical histories and the medical test results, classifying the population into one of the following sub-populations classifications for a selected biological condition:

a. at risk and affected *(ARA)* by the selected biological condition; and

b. at risk and unaffected *(ARU)* by the selected biological condition.

2. The method of claim 1, further comprising generating statistical data related to the medical histories and the medical test results wherein classifying the population comprises analyzing the statistical data.

3. The method of claim 1 wherein analyzing medical histories comprises assigning numerical scores to selected conditions associated with the selected biological condition.

4. The method of claim 1 wherein analyzing medical test results comprises assigning numerical scores to selected medical tests associated with the selected biological condition.

5. The method of claim 1 wherein analyzing medical histories and medical test results comprises assigning numerical scores to selected conditions associated with the selected biological condition and analyzing medical test results comprises assigning numerical scores to selected medical tests associated with the selected biological condition.

6. The method of claim 5 wherein classifying the population comprises evaluating the numerical scores for the medical histories and the medical test results.

7. The method of claim 6 wherein classifying the population comprises combining the numerical scores for the medical histories and the medical test results and classifying the population based on the combined numerical scores.

8. The method of claim 5, further comprising generating statistical data related to the numerical scores for the medical histories and the medical test results wherein classifying the population comprises analyzing the statistical data.

9. The method of claim 8 wherein the statistical data comprises generating a frequency distribution plot related to the numerical scores for the medical histories and the medical test results.

10. The method of claim 1, further comprising comparing the medical histories and the medical test results of the sub-population classified as *ARU* with the medical histories and the medical test results of the sub-population classified as *ARA*.

11. The method of claim 1 wherein the medical test results comprises genetic test results, the method further comprising comparing the genetic test results of the sub-population classified as *ARU* with the genetic test results of a selected portion of the sub-population classified as *ARA*.

12. The method of claim 11, further comprising determining genetic differences between genetic test results of the sub-population classified as *ARU* with the genetic test results of the sub-population classified as *ARA*.

13. The method of claim 12, further comprising identifying genetic drug targets based on the genetic differences between genetic test results of the sub-population classified as *ARU* with the genetic test results of the sub-population classified as *ARA*.

14. The method of claim 1, further comprising selecting the portion of the sub-population classified as *ARA* and using the selected portion as a control group.

15. The method of claim 1 wherein classifying the population further comprises classifying the population into the *ARA* sub-population, the *ARU* sub-population or a sub-population classified as unknown risk and unaffected (*URU*) by the selected biological condition.

16. The method of claim 15, further comprising comparing the medical histories and the medical test results of the sub-population classified as *ARU* with the medical histories and the medical test results of the sub-population classified as *URU*.

17. The method of claim 15 wherein the medical test results comprises genetic test results, the method further comprising comparing the genetic test results of the sub-population classified as *ARU* with the genetic test results of the sub-population classified as *URU*.

18. The method of claim 17, further comprising determining genetic differences between genetic test results of the sub-population classified as *ARU* with the genetic test results of the sub-population classified as *URU*.

19. The method of claim 18, further comprising identifying genetic drug targets based on the genetic differences between genetic test results of the sub-population classified as *ARU* with the genetic test results of the sub-population classified as *URU*.

20. A method of data analysis to identify a selected population, comprising:

defining disease characteristics of a selected biological condition, including medical tests associated with the selected biological condition;

analyzing medical test results based on medical tests performed on biological samples from a plurality of subjects with respect to the defined characteristics of the selected biological condition;

based on the analysis, determining the affected status of each of the plurality of subjects;

defining risk characteristics of the selected biological condition;

based on the risk characteristics, determining a risk status of each of the plurality of subjects;

based on the affected status and the risk status, classifying each of the plurality of subjects into a predetermined category for the selected biological condition.

21. The method of claim 20 wherein the defined disease characteristics of the selected biological condition have associated numerical scores and determining the affected status of each of the plurality of subjects comprises determining numerical scores based on the analysis of the medical test results.

22. The method of claim 20 wherein the defined risk characteristics of the selected biological condition have associated numerical scores and determining the risk status of each of the plurality of subjects comprises determining numerical scores.

23. The method of claim 20 wherein the defined disease characteristics of the selected biological condition have associated numerical scores and the defined risk characteristics of the selected biological condition have associated numerical scores, the classification of each of the plurality of subjects into a predetermined category being based on the numerical scores for affected status and risk status.

24. The method of claim 23 wherein the numerical scores for affected status and risk status are combined to form a combined numerical score, the classification of each of the plurality of subjects into a predetermined category being based on the combined numerical scores for affected status and risk status.

25. The method of claim 20 wherein the medical tests associated with the selected biological condition have varying degrees of relevance in defining the disease characteristics, the method further comprising assigning relevance weighting factors to the medical tests based on the degree of relevance, the affected status being based on the weighted medical tests.

26. The method of claim 20, further comprising generating statistical data related to the affected status and risk status wherein classifying each of the plurality of subjects into a predetermined category comprises analyzing the statistical data.

27. The method of claim 20 wherein the plurality of subjects are classified into a category selected from a group comprising at-risk, affected *(ARA)* and at risk unaffected *(ARU)*.

28. The method of claim 27 wherein risk status is determined at least in part from medical histories of the plurality of subjects, the method further comprising comparing the medical histories and the medical test results of the group of subjects classified as *ARU* with the medical histories and the medical test results of the group of subjects classified as *ARA*.

29. The method of claim 27 wherein the medical test results comprises genetic test results, the method further comprising comparing the genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *ARA*.

30. The method of claim 29, further comprising determining genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *ARA*.

31. The method of claim 30, further comprising identifying a genetic drug target based on the genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *ARA*.

32. The method of claim 30, further comprising identifying a diagnostic assay based on the genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *ARA*.

33. The method of claim 30, further comprising identifying a vaccine component based on the genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *ARA*.

34. The method of claim 20 wherein the plurality of subjects are classified into a category selected from a group comprising at-risk, affected *(ARA)*, unknown risk, unaffected (*URU*), and at risk unaffected *(ARU)*.

35. The method of claim 34 wherein risk status is determined at least in part from medical histories of the plurality of subjects, the method further comprising comparing the medical histories and the medical test results of the group of subjects classified as *ARU* with the medical histories and the medical test results of the group of subjects classified as *URU*.

36. The method of claim 34 wherein the medical test results comprises genetic test results, the method further comprising comparing the genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *URU*.

37. The method of claim 36, further comprising determining genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *URU*.

38. The method of claim 37, further comprising identifying a genetic drug target based on the genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *URU*.

39. The method of claim 38, further comprising identifying a diagnostic assay based on the genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *URU*.

40. The method of claim 38, further comprising identifying a vaccine component based on the genetic differences between genetic test results of the group of subjects classified as *ARU* with the genetic test results of the group of subjects classified as *URU*.

41. A system for data analysis to identify a selected population, comprising:

a affected status data structure containing numerical data defining disease characteristics of a selected biological condition, including medical tests associated with the selected biological condition;

a disease risk data structure containing numerical data defining disease risk characteristics of the selected biological condition; and

a processor to:

accept medical test results from a plurality of subjects and assign affected status numeric scores to the medical test results based on the numerical data defining disease characteristics of the selected biological condition;

store the affected status numeric scores for each of the subjects in the affected status data structure;

accept medical history data from a plurality of subjects and assign disease risk numeric scores to the medical history data based on the numerical data defining disease risk characteristics of the selected biological condition;

store the disease risk numeric scores for each of the subjects in the disease risk data structure; and

determine a affected status and risk status for each of the subjects based on the respective affected status numeric scores and the disease risk numeric scores.

42. The system of claim 41 wherein the processor combines the numerical scores for affected status and risk status to form a combined numerical score, the processor further classifying of each of the plurality of subjects into a predetermined category being based on the combined numerical scores for affected status and risk status.

43. The system of claim 41 wherein the medical tests associated with the selected biological condition have varying degrees of relevance in defining the disease characteristics, the processor further assigning relevance weighting factors to the medical tests based on the degree of relevance, the processor determining the affected status based on the weighted medical tests.

44. The system of claim 41 wherein the processor further generates statistical data related to the affected status and risk status, the processor further classifying of each of the plurality of subjects into a predetermined category being based on the combined numerical scores for affected status and risk status based on analysis of the statistical data.

45. The system of claim 41 wherein the processor further classifies each of the plurality of subjects into a predetermined category selected from a group of categories comprising at-risk, affected *(ARA)* and at risk unaffected *(ARU)*.

46. The system of claim 41 wherein the processor further classifies each of the plurality of subjects into a predetermined category selected from a group of categories comprising at-risk, affected *(ARA)*, unknown risk, unaffected *(URU)*, and at risk unaffected *(ARU)*.